



MELODY MAKERS

You can turn your PC into a recording studio without breaking the bank. In part two of our guide, Ben Pitt explains those all-important recording decisions and techniques

There's no reason why you can't make professional-quality recordings on a budget PC. In the last issue, we looked at the equipment you'll need, plus packages for electronic music production, solo performers and bands. A copy of the first part of this series is included on this month's cover disc.

High-quality equipment doesn't guarantee high-quality recordings. While affordable kit makes music production more accessible than ever, it doesn't necessarily make it easier to carry out. This month, we'll guide you through the process of recording music. As well as focusing on the digital side, we'll reveal all the tricks of the trade, from where to put the microphones to editing different takes together. Mixing down to a final stereo recording is an art in itself, so we'll cover this next month.

Music producers often develop individual working methods that suit their taste in music. This is to be encouraged. After all, if everyone did exactly the same thing, records would sound very bland. However, we hope that the advice offered by this feature at least helps newcomers get started.

The history of recording follows a general trend to make things bigger and beefier than before. But now anyone can pluck an enormous, shiny drum loop off a sample library, producers are finding new ways to push the boundaries. Weird, gritty sounds are currently in fashion in certain forms of pop music – listen to Justin Timberlake for proof. So, too, are old-fashioned recording techniques to give a retro production, as demonstrated by Amy Winehouse and most current British indie bands. These – and indeed any – objectives are perfectly valid. Just bear in mind that it's much easier to make a big, clean recording sound small, dirty or antiquated than it is to do the opposite.

As such, we recommend that you record with as much clarity as possible when you're starting out, and leave any roughening up to when you come to mix.

RECORDING DECISIONS

A record producer's role is similar to a director's role in a film. Regardless of whether or not you have written the script or are playing the starring role, your job is to bring all the different

disciplines and people together into a homogenous finished product. Recording can be just as creative a process as writing, so try to make the production reinforce the song and the ethos of the band.

If you want to capture the sound of a live band playing together, you might want to record all the instruments at the same time, and steer clear of adding 12 tracks of backing vocals and synth strings over the top. Recording everyone together is essential for jazz and classical music. However, if you are recording a solo performer or a pop act, they might appreciate your input in adding some more instruments to fill the sound out.

Make sure the instruments are in good condition. New guitar strings or woodwind reeds can give a brighter, more detailed tone, while a squeaky chair or bass drum pedal can ruin a recording. Tune the tension of drum skins and check the tuning of pitched instruments before each take. Consider using different types of drum beaters, and damp drums by taping bits of tissue or cloth to the skins if their sound rings for too long.



If the recording is just a rough demo, the odd mistake won't matter, but if it might end up being the final recording you'll want it to be as good as possible. Have the performers rehearsed enough to give their best performance, or is a slightly chaotic performance preferable? Is the composition even finished, or do some sections need a little more work? It's hard for songwriters to reject an idea they may have spent weeks working on, so a producer can provide valuable quality control. If you think the egos of the performers and songwriters can take it, be ruthlessly honest with your criticism. If you're the songwriter, performer and producer, apply the same brutal honesty to yourself.

Not all recording projects aim to capture a finished piece of music. Many musicians compose with their PC, recording one part at a time as they write it. In this scenario, don't worry too much about recording quality and get your ideas down quickly. You can always replace specific instruments later, and you'll probably give a better performance once the composition has taken shape.

The recording location has a huge impact on its quality. Reverberation, or reverb, is the audible result of sounds bouncing off walls and other surfaces. It's why the sounds made in a bathroom or cathedral or on a mountain are all

quite different. Reverb simulation is a vital component of mixing, but it's impossible to eliminate natural reverb completely while recording. You have two options: record somewhere where the reverb suits the style of music, or try to reduce it as much as possible so you can mask it with artificial reverb when you come to mix.

There are no hard and fast rules as to what type of reverb suits which music, but people associate specific genres with certain types of venue: choral music in a church, classical music in a concert hall, garage rock in a garage and so on. Electronic genres such as pop, dance and hip-hop tend to make up their own rules, so listen to your favourite CDs for inspiration. If your recording venue is fixed and its acoustics aren't particularly desirable, try to absorb as much reverb as possible by filling the room with soft furnishings such as sofas and duvets. Thin furnishings such as curtains, carpets and egg boxes absorb only high frequencies, so they're not really worth the bother.

Try to minimise unwanted sounds in the microphone. Watch out for background noise, whether it's from traffic, pets or your PC's fans, and make sure the click track isn't being picked up from the headphones when recording quiet instruments. If you're recording more than one instrument at once, try to isolate them so there's not too much spill from each instrument into the others' microphones. You can put a guitar amplifier in another room from a drum kit and use a long lead so the two performers can still see each other, which often helps to produce a tight performance.

Alternatively, record instruments one by one. What you lose in live interaction, you may make up for in being able to focus all your attention on one instrument at a time to make sure it's spot on. The accepted wisdom is to start with the drums, then the bass, followed by the guitars, keyboards and any other instruments, and finally the vocals. However, you might want to record a rough 'guide' vocal early on to help the other players keep their place in the song.

PASS THE MIKE

Walk around the room while someone is playing an instrument and you'll notice that the sound varies considerably. This is partly because sound reflections reinforce and cancel out certain frequencies at different points in the room, but also because instruments emit different sounds in different directions. Another variable is caused by the fact that reverberation is at a fairly constant volume throughout the room, but the direct sound coming from the instrument gets much louder the nearer you get to it.

Some instruments such as brass and the voice emit sound from a point source (a single point in space), so positioning the microphone 'on-axis' – that is, directly facing the instrument – is usually the best place to capture a full tone. However, most instruments emit their sound from different parts of the instrument body. This is obvious in a drum kit, but it's equally true of acoustic guitars, pianos, flutes and violins. Therefore, moving the microphone by just a few inches can make a big difference. It's often tempting to get the microphones as close to the instrument as possible to get a healthy level and reduce the relative amount of reverberation, but get too close and you'll just be recording a small area of the instrument's body and missing the blend of its overall tone. Getting too close might also obstruct the performer's movement.

Pop producers often put microphones right inside grand pianos, which is fine if you want a bright, edgy tone. However, if you want the sound of a classical grand piano, you're better off recording from about 10 feet away, where the sound has blended and smoothed out after reflecting off the inside of the piano lid. The same goes for ensembles of acoustic instruments – try to find a place that's not so far that the sound becomes awash with reverberation, but not so near that it over-emphasises the closest instruments. Putting microphones high up in front of an ensemble is an effective way to get a balance of the instruments at the front and the back. You might also want to put individual microphones, known as spot mics, on each instrument, but this often isn't necessary if you just want to capture the natural sound of a live performance.

In practice, the most effective way to find the best microphone position is to move your head around until you find a place where the instrument sounds best. However, this isn't possible if you're recording your own playing, in which case you'll need to jump to the next stage in the process. Put on a pair of headphones, set up the microphone and slowly move it around and hear how the sound changes. If your headphones don't cut out enough sound going directly from the instrument to your ears (which is bound to be true when recording very loud instruments such as drums), you'll need to do short test recordings to see the effect of microphone positions.

Use stereo pairs of microphones whenever possible. Except for point-source instruments such as brass and vocals, recording with two microphones and panning them to the left and right speakers will produce a sound that seems far more detailed and spacious. To re-create the sound of two ears in a room faithfully, position



◀ When recording large ensembles of acoustic instruments, a pair of microphones often works best. Positioning them high up (shown here attached to a wire above the conductor's head) keeps them close to the ensemble, but not too close to any specific instrument



the microphones a head's width apart, facing at a 90° angle from each other and towards the performer. For pop recording, where such faithful accuracy isn't so important, feel free to experiment to get a pleasing sound.

OK COMPUTER

The tutorial on page 164 will guide you through the various stages of recording and editing audio and MIDI performances on your PC. It may seem a complex process, but if you break it down into simpler steps it will be less daunting. That said, there are various extra details to consider that can make your recording sessions run more smoothly and yield better results.

A low-cost PC can do a very convincing impression of a top-flight recording studio. Modern music-production software emulates multi-track tape recorders, huge mixing desks and racks upon racks of effects processors, and can also turn its hand to grand pianos, analogue synths and symphony orchestras in the form of virtual instruments. The virtual instrument plug-ins have the advantage of being more affordable and better quality than hardware synths, and best of all, they integrate seamlessly with your recording software to give a fully self-contained recording environment.

However, there are compromises. One is that it's harder to visualise audio signal paths when they all exist within a single box with various pop-up windows for visual feedback.

Another is that, unlike analogue audio devices, digital audio processing takes a quantifiable amount of time. Even if it's only a few milliseconds, this can cause problems.

Audio exists as a continuous stream, but music-production software needs to work with discrete blocks of audio. Once it has processed a block, it sends it to its next destination and gets working on the next. The size of each block limits how quickly the software can react to user input. A 50-millisecond block means there will be 50ms latency (delay) after pressing record, start or stop for the software to respond – not a huge problem. However, if you play or sing a note and have to wait 50ms to hear the result, this can be distracting. Low-latency drivers are essential. They allow the software to communicate with the audio interface using very small blocks; three to 10ms is considered acceptable when working with virtual instruments. Two types of driver – WDM and ASIO – can deliver this performance. We find ASIO is generally more reliable. Reducing the latency (sometimes known as the buffer size) too much can increase the load on the computer and cause glitches in recording, so experiment with settings before you have a critical recording job to do. Most audio software presents its latency setting in the same place as its audio driver settings.

Latency is an inescapable inconvenience when recording virtual instruments, but it is bearable. After all, an acoustic piano has a

certain amount of latency, too, as the hammer travels towards the strings. However, it's more problematic when recording audio, as hearing your voice or guitar just a couple of milliseconds late as you perform can be very off-putting. Thankfully, latency can be avoided altogether during audio recording by monitoring the signal before rather than after the input has passed through the software. Some audio interfaces include manual hardware controls to set how much of the input is piped directly to the output, and they all have software utilities for the same function, as described in Step 7 of the tutorial.

The exception to this rule is when recording an electric guitar directly into the PC. You'll probably want to hear the sound through a guitar amp simulator plug-in rather than the feeble-sounding raw signal. In this case, you'll have to put up with some latency. A much better solution is to put a microphone in front of a guitar amp and this usually gives better audio quality, too.

RHYTHM SECTION

Think about whether you want to record to a fixed tempo or just use the computer like a free-running tape recorder. The main advantage of recording to a fixed tempo is that editing is easier. With all recordings locked to a tempo grid, it's easy to move things around, trying out ideas in different sections and repeating or deleting blocks. This certainly makes sense if



Mike and the mechanics Setting up microphones for band recording

The main text explains the concepts behind positioning microphones, but if you just want to get on with recording, here are some tips.

Record vocalists 20 to 30cm away from a condenser microphone, being careful to face it the right way. Most large condenser mics are sensitive on the side where the logo is, and not on the top of the microphone. Use a pop shield, a nylon mesh, between the singer and microphone to stop 'p' and 'b' sounds causing the microphone to pop.

Electric guitars are best recorded by putting a microphone in front of a guitar amp. Position it a couple of inches from the centre of the speaker and move it to the side

or further away to smooth out the sound if necessary. You can do the same for bass guitars, but many people prefer to plug them straight into the computer. Be sure to use direct-injection (DI) input suitable for guitars.

Position (preferably two) condenser microphones about a foot apart and away from acoustic guitars and orchestral strings, facing the sound board. For violins and violas, this means placing the microphones above the player, but keep them out of the way of the bow. Record woodwind from a metre away, bearing in mind that their sound comes out of any open holes and not just the bell. Brass instruments just need a single microphone a foot away from the bell.

pointing towards the centre of the drum for a full sound. Get them as close as possible to get the loudest volume you can, thereby reducing the relative volume of the other drums in the microphone, as this will make them easier to mix. It's also worth putting a microphone on the underside of the snare drum, as the snares (metal springs) give it a different sound to the top of the drum.

There is so much cymbal level in the overheads that dedicated microphones aren't necessary, but a hi-hat microphone might still come in handy. Position it so that it doesn't get a blast of air as the cymbals close together, and angle it to reduce the amount of snare drum it picks up.



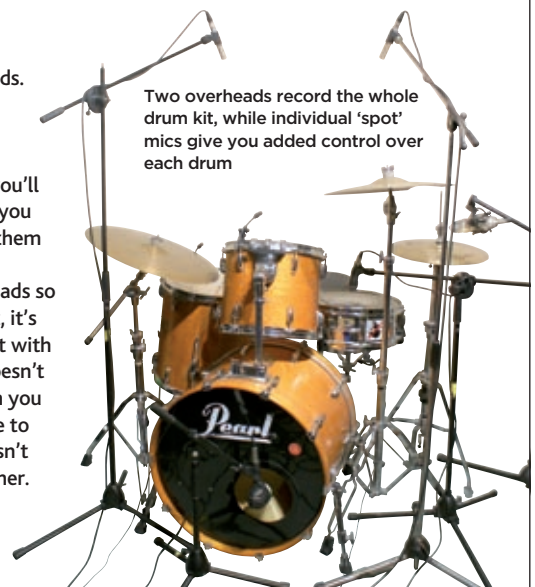
◀ A pop shield stops bursts of air distorting the microphone and keeps the vocalist the right distance from the mike

DRUM IT IN

When recording drums, the two most important microphones are the overheads. These are positioned about a metre apart and a metre directly above the drum kit. They pick up a blend of the whole kit, so for a natural drum sound you'll be using these fairly prominently when you come to mix. Try to position and angle them so the snare is equally loud in each one.

The bass drum gets lost in the overheads so it needs a dedicated microphone. In fact, it's possible to get a decent drum sound just with these three microphones, although it doesn't leave much scope to do fun things when you come to mix. Tuck the microphone close to the hole in the bass drum skin. If there isn't one, consider removing the skin altogether.

Snare and tom mics should be positioned where they won't risk being hit with a drum stick, and



Two overheads record the whole drum kit, while individual 'spot' mics give you added control over each drum

**Performance pointers** Getting the best from your musicians

The most important part of music production is getting good performances from the players and singers. Drummers and guitarists will probably be happy to bash and strum away, but they might need you to point out if certain sections could be better. Singers are often less relaxed and confident, though, and many take criticism of their performance quite personally. Vocals are often the most important part of a recording, so it's vital you get the best possible performance.

Try to record singers at the best time of day so they feel comfortable and relaxed. Make sure they're fed and watered, but avoid stodgy food as it doesn't help the vocal cords or the energy levels. People react better to praise than to criticism, so pick out positive

elements of their performance and encourage them to do more of it. Just don't give them too many things to remember as they perform, as they won't have the mental space to think about expressing themselves musically.

It can take a few minutes before the voice is warmed up, so don't expect to get the best take first time. However, some singers' attention wavers after a couple of takes, so it's a good idea to warm up with scales or other exercises. If they feel silly doing this, join in with them, or ask them to sing along to a CD.

Some singers can turn in a flawless performance time after time, but others are more variable. You might find that three takes is enough, or that 20 are necessary. It will be obvious when you have done enough, either

because each one is indistinguishable from the previous one, or when quality drops as the singer becomes physically or mentally tired. If you're not getting what you want and frustration sets in, take a break and try again later, or even on another day.

If you're recording your own songs, it's hard to play the roles of writer, performer and producer at the same time. As such, it's essential to listen critically to your performances a day or two after you've done them. Get second opinions from people you can trust to tell you the truth, and who understand the kind of music you're making. You don't have to live or die by other people's opinions, but other points of view can help you see things in a fresh light.

you're recording as you compose, and it's standard practice for electronic musical genres.

Recording to a click track or other form of guide such as a sample loop doesn't necessarily mean recording to a constant tempo. All serious recording software supports tempo changes. However, many rock and indie bands perform best when they are not constrained by a predetermined tempo, and jazz bands and classical ensembles wouldn't dream of it. This makes editing trickier, but not impossible.

Spend some time getting the headphone balance and overall level right so the performer feels comfortable. They won't necessarily want to hear a nicely balanced mix while recording. It's more likely they will want plenty of

themselves and whatever instruments will help them keep in time and in tune. If you've bought the Alesis iO26 audio interface to record multiple simultaneous inputs (as recommended in part one of this feature), take advantage of its ability to create two independent headphone mixes for different performers.

ADVANCED TECHNIQUES

Software designers and music producers are constantly finding new ways to improve the quality of recordings. Even when you're starting out, there are a few tricks worth investigating.

One of the most popular techniques is to compile sections of different takes into a best-of version. Computers make it very easy to record a

virtually unlimited number of takes, chop them up, move them around and put them back in whichever order you like. This can make a huge difference to the quality of vocal performances in particular, but it comes in for criticism. The ability to patch up less-than-ideal performances means musicians no longer have to master their instruments or voices to make records. However, it's hard to edit a performance to make it more passionate or soulful. It's best to think of this technique as a liberating tool, letting the performer experiment without having to worry about making mistakes. See the tutorial for advice on crossfading between takes to create a seamless blend. Bear in mind that making a seamless blend isn't just about avoiding glitches, but also choosing takes that work together as a convincing continuous performance.

Another reason to record multiple takes is for double-tracking. This involves using two takes of the same performance simultaneously, often panned to either speaker. As long as the timing is consistent, it gives a dramatic injection of power to energetic music and glossy richness to gentler performances. Double-tracking works well for vocals and guitars, and even better for orchestral strings.

Using samples is an easy way to make recordings sound professional, but it can feel like painting a picture using clip art. However, making musical collages from less predictable sound sources can be far more rewarding. Other people's records are a useful source of musical material (albeit with legal ramifications if the recording is released), but so too is the TV, a microphone and an assortment of props or the great outdoors. Found sounds aren't the preserve of obscure electronica. Doubling a bass drum with a sample can give extra welly to rock music, while countryside sounds are perfect for a folk recording. Dropping samples directly on to an audio track often works well, but loading them into a sampler virtual instrument and playing them with a MIDI keyboard can generate something more melodic or rhythmical from otherwise non-musical sounds.

NEXT MONTH

We hope that this feature has left you with plenty of things to try out for the next few weeks. Next month, we'll conclude this three-part feature by guiding you through the process of mixing your music down to a single stereo audio file.

Audio vision Sample resolutions explained

Many audio interfaces and music-production applications can record at up to 192kHz and 24-bit. These figures refer to how often and how precisely the analogue audio is measured or 'sampled' as it is converted to digital audio. 192kHz and 24-bit equate to 192,000 measurements per second, each one from a range of 16.7 million possible values. If that sounds like overkill, you're probably right – audio CDs sound pretty good, and they are fixed at 44.1kHz and 16-bit.

Running at high resolutions creates larger audio files on your hard disk and requires more computing power to manipulate. We don't recommend recording any higher than at 44.1kHz. This sample rate covers the human hearing range of 20Hz to 20kHz, and any marginal benefits of higher sample rates are lost when you export to audio CD or MP3.

However, there is a tangible benefit to recording at 24-bit, even though the final mix will only be at 16-bit. It's the nature of bit depths that adding a bit doubles the precision of each measurement, so 24-bit data isn't a third more accurate than 16-bit but is actually 256 times more accurate. This means that it's possible to record a quiet signal to avoid any possibility of distortion and still capture plenty of detail. Even if it's barely registering on the input meters, it's probably more detailed than a full-volume 16-bit recording.

Most music-production software defaults to 24-bit, 44.1kHz recording. If you wish to change these settings, you'll find the sample rate setting in your recording software's audio driver options, and the bit depth in the interface's software utility.



◀ Alesis's iO26 supports sample rates from 44.1kHz to 192kHz



HOW TO... Record with MackieTracktion

Here we show you how to record and edit audio and MIDI performances on your PC

Using recording software for the first time needn't be a daunting experience. Follow these steps and they'll soon become second nature. We have used Mackie Tracktion (reviewed in *What's New: Software*, *Shopper* November 2007) for this tutorial, but the process is similar for any music-production software.

1 ASSIGN YOUR HARDWARE

The first time you use your software, you'll need to tell it what audio and MIDI inputs and outputs you want it to address. Most software presents these options in a Preferences or Settings dialog box, and Tracktion uses a Settings tab. The first subheading, marked audio, presents a drop-down list of audio drivers. Pick the ASIO driver that relates to your audio interface. By default, only the first stereo inputs and outputs are enabled, so activate as many as you plan to use.

If you're recording a stereo source, it's best to record it as a single stereo file rather than two independent mono files. To do this, select an input and tick the box labelled 'Treat as stereo channel pair' to link it with the input directly below it. Click the Midi subheading and activate any MIDI inputs and outputs you want to use.

2 CREATE A FOLDER FOR YOUR FILES

PC-based music production involves creating lots of discrete audio files that are brought

together inside your music-production software, which creates its own files, too. Keeping these files neatly arranged in folders makes it easier to back up and archive projects. Tracktion (and most other music software) asks you to create a project folder as soon as you start a new project. If you have more than one internal hard disk, select the one that doesn't hold your Windows installation.

3 SET THE TEMPO AND CREATE A CLICK TRACK

Double-click the name of your project as it appears in the Edits folder to open it (in other software, it should already be open). If you want to record to a click, activate the click track by typing C. Adjust the tempo and time signature display by clicking on them (they are located just above the transport controls) and inserting values in the Properties panel that appears.

If the music includes tempo or time signature changes, program these into your project by inserting changes at specific bars with the buttons in the properties panels, or by drawing directly on to the Global track. Don't forget to include a spare bar or two at the beginning to use as a count-in.

If you want to record to something more substantial than a click – or if you are producing mostly electronic music with just the occasional live instrument – then go straight to Steps 11 and 12 to start working with samples and MIDI instruments.

4 CREATE TRACKS AND ASSIGN INPUTS

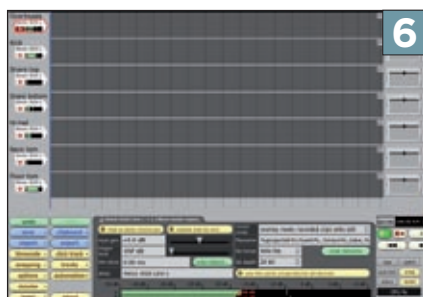
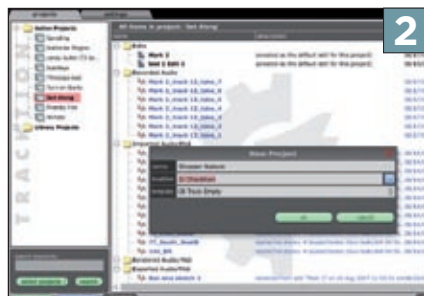
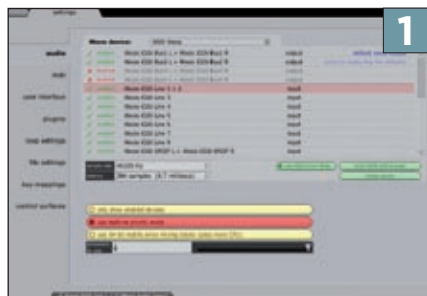
Create audio tracks (lanes on the main recording panel) by typing Ctrl-T. You'll need one for each microphone or line input, although stereo pairs can share an input. In some software, such as Cubase, you'll need to specify whether a track is mono or stereo as you create it, but most other software works this out automatically. Click on the track titles and rename them in the Properties panel to denote the instrument they will be recording. Click the arrow to the left of each track and select an input for it to record.

5 PLUG IN YOUR MICROPHONES

Connect the microphones and other sources to the inputs on your audio interface. Switch on phantom power for the microphones that need it (you will find that dynamic microphones don't, but condenser microphones do). Phantom power switches are often grouped in pairs (as here), fours or eights. If you're using a mixture of condenser and dynamic microphones, you can supply phantom power to both types without doing the dynamic mics any harm, as long as they have a balanced output (see last month's feature for details).

6 SET THE INPUT LEVELS

Click on the R button for each input to prepare or 'arm' it for recording. Its settings and a large level meter will appear in the





Properties panel. Ask the performer to play the instrument at the loudest volume they'll be performing at. Set the volume control – a hardware knob or fader on your audio interface, or a virtual one in its software mixer utility – so the level meter peaks at between -12dB and -6dB. You must keep this level well below 0dB (full volume), because performers usually play and sing louder once they get going in earnest.

Once you have set the levels, don't touch them for the rest of the recording session (unless you have to lower them to avoid distortion), as this will make it easier to splice different takes together.

7 CREATE A HEADPHONE MIX

Performers need to hear themselves, other instruments and the click track, and they need headphones to do so without the sound leaking into the microphones.

In Traktkion, arming each track for recording also sends it to the software's audio output, but we want to monitor the inputs directly rather than through the software to avoid latency. In Traktkion, select an input to view its Properties panel and deactivate the Enable end-to-end button to turn off monitoring through the software. Locate your audio interface's playback mixer to monitor the inputs directly. This mixer works independently of the levels being recorded to the hard disk, so you can adjust each input without affecting the recording.

8 RECORD A TAKE

Do a test recording to make sure everything is working properly. Check each track is recording what it's meant to be, and that no tracks are distorting or recording silence. If your PC is in the same room as the performer, this will probably be your first chance to gauge how well the microphones are positioned, so use the test recording to consider whether it's worth moving any of them. Once everything is exactly as you want it, make sure your performers are warmed up, in tune and comfortable, then hit the record button and record a few takes.

If you're recording an ensemble or drum kit, record different takes one after the other.

For overdubs (instruments recorded to other, pre-recorded material), record multiple takes on different tracks, muting tracks using the M buttons on the right as you record to new ones.

9 SPICE TAKES TOGETHER

When you have a handful of takes to choose from, you'll probably find that different ones are better at different points, or you might have one great performance except for the odd mistake.

To compile different performances that were recorded one after another on the arrange window, locate the point at which you want to switch takes and split the recording by selecting all the tracks (drag the mouse while holding the Alt key) and typing /. If you have recorded to a click track or other sounds that follow the project's tempo, the snap-to-grid function will help you find the downbeat. If not, type Q to disable snapping and zoom right in to view the waveform. Drums are particularly handy for identifying downbeats.

Drag and drop sections to compile the takes you want, using snapping to keep things in time if your recording follows the project's tempo, or by zooming in and lining up by eye and ear if it doesn't. If the join sounds untidy, create a quick crossfade just before the downbeat. To do this in Traktkion, drag the second take slightly to the left using the arrows in the top-left corner of the audio objects. This extends the start point without altering the timing of the recording. Select each object in turn and type X to crossfade across the length of the overlap.

10 COMPILE THE BEST OVERDUB TAKES

Splicing together overdubs, such as vocals, is slightly different. The various takes should already be in time with each other, as they were recorded to the same backing track. To compile the best bits, split the performances into manageable chunks using the / key. Select all the blocks and type Shift and the '-' (hyphen) key to mute them, then un-mute blocks one by one to audition them and build up your ideal performance.

Once you're done, discard the unused takes (using Save then Save As to create a copy first in case you change your mind later). Drag the remaining blocks on to a single track, holding down Shift as you do so to ensure that their timings aren't altered. You may need to overlap and crossfade blocks, as described above.

11 ADD SAMPLES

Sample loop libraries provide a quick way to fill out a recording. You can customise them by chopping them up, or make your own using a stereo editor such as Audacity.

Import an audio file using Traktkion's built-in browser, which is available by clicking the button at the top-left of the screen. When you import audio files into the project, the software will ask whether you want to copy the source file to your project directory. It's worth doing so to keep all the files in one place for easy archive and backup.

Samples with the necessary metadata will automatically lock to the project's tempo. For a sample that doesn't, select it and click the loop properties tab in the Properties panel. Specify how many beats long the sample is (usually four, eight or 16) and activate the auto tempo button. On the sample itself, click the L button to loop it, drag its right edge to extend its length and move the white loop marker so it repeats in time with your track.

12 USE VIRTUAL INSTRUMENTS

To record using virtual instrument plug-ins and a MIDI keyboard, type Ctrl-T to create a new track, drag the New filter button at the top-right of the screen and drop it at the left end of the chain of objects at the right of the track. A list of installed plug-ins will appear, with the virtual instruments ending with (synth). Choose one and load a preset using the instrument's interface.

Back in Traktkion's main window, select your MIDI keyboard as the input for the track, click the R button to activate it and the record button to record. Double-clicking a MIDI recording reveals a MIDI editor, where you can create, delete and move individual notes.

